Space Weather Forecast

Issued on Sunday, 11 June 2023 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of Moderate X-ray flares (R1-R2 radio blackouts) throughout. Very slight chance of Minor Geomagnetic Storms 11-14 June.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with only Common-class flares observed from the sun. There are currently eight sunspot regions on the disc, the largest of which is in the southeast, although the region appears inactive at this time. Two other regions are moderately large and complex, one just west of centre disc in the south and the other in a similar position in the northern hemisphere. The remaining regions are all relatively small and/or stable and inactive. No other Earth-directed Coronal Mass Ejections (CMEs) have been observed in available coronagraph imagery.

Solar Wind / Geomagnetic Activity: The solar wind speed has been at ambient levels varying between 290-340km/s. The total magnetic field strength was largely weak, with the important north-south component also varying weakly. An abrupt increase in the total magnetic field strength to Moderate levels late in the UTC day is indicative of a passing, but weak CME, with a moderately positive north-south component observed. Geomagnetic activity was Quiet (Kp 0-2) throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be generally Low, but with a chance for isolated Moderate flares. Two regions near the centre disc and one region in the southeast pose the greatest risk of significant flaring.

Solar Wind / Geomagnetic Activity: Several weak CME glancing blows are possible at Earth in the coming days, however each carries only low-moderate confidence in terms of timings and effects. Coronal hole high-speed streams from one or more regions may affect Earth from Day 1 (11 June), possibly giving speeds of 400-450km/s but with low confidence given their relative latitudes on the sun. Geomagnetic activity is forecast to be mainly Quiet to Unsettled, with a chance of Active (Kp4) or very slight chance of G1/Minor Storm intervals (Kp5) resulting from any CME or high-speed stream effects. No appreciable enhancement of the auroral oval is expected.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected, however there is a very slight chance of reaching the S1/Minor Storm threshold should any larger X-ray flares occur.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	35	35	35	35
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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